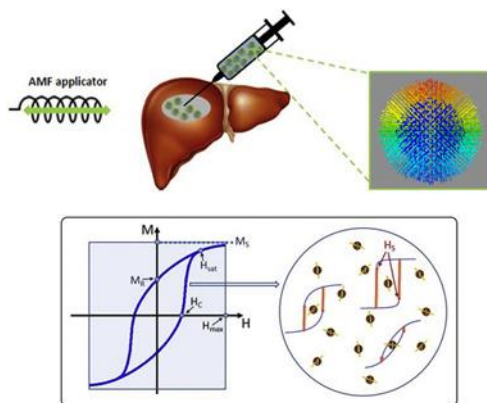


# PhD position

**The programme\*** offers a 3-year funded research position for postgraduate students holding a Masters' degree, to pursue a PhD programme at the Universidade de Santiago de Compostela (USC), in Galicia, Spain. <https://www.usc.gal/en>

**The project:** “Development of a theoretical model of magnetic colloids for biomedical applications with treatment of spin and particle dynamics”

**Objective:** to develop a Monte-Carlo/Molecular Dynamics model to simulate the nature and evolution of the agglomeration processes of magnetic colloids, mainly focused on biomedical applications (hyperthermia cancer treatment, magnetogenetic control of cellular activities, etc.).



F. Soetaert *et al.*, “Cancer therapy with iron oxide nanoparticles: Agents of thermal and immune therapies” *Adv. Drug. Deliv. Rev.* 65, 163 (2020).

## Stages:

1. Using an existing theoretical framework, test a simplified model of the coupling between the magnetic moment and the particle, for time scale separation.
2. To develop an AI method (based on fractal algorithms) to investigate the nature and evolution of nanoparticle clusters.
3. Use of a kinetic Monte Carlo model to simulate the effect of agglomeration on magnetic and heating properties.

The project will be carried out in collaboration with leading experimental groups, to verify and validate the model. The thesis will be co-supervised by Dr. David Serantes Abalo, *Ramón y Cajal* researcher at the USC, and Prof. Roy Chantrell, from the University of York (UK).

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\*Ref. ED431F 2022/05, CONSOLIDACIÓN 2022 - PROXECTOS DE EXCELENCIA